Wastewater Treatment

Prior to adoption of the TMDL, Vermont statute limited discharges of phosphorus from wastewater treatment facilities in the Lake Champlain Basin to 0.8 mg/l (milligrams per liter), except for facilities permitted prior to 1991 that discharged less than 0.2 mgd (million gallons per day), and municipal aerated lagoon type wastewater facilities providing a secondary level of treatment and were permitted prior to 1991.

The TMDL required two changes to the phosphorus removal policy for Vermont wastewater treatment facilities. The first change was that the statutory exemption for aerated lagoon plants was removed and the eight municipal aerated lagoon facilities with greater than 0.2 mgd permitted flow are no longer exempt from the requirement to remove phosphorus to 0.8 mg/l on a monthly average basis. This change requires capital improvements at five municipal aerated lagoon facilities: Hardwick, Richford, Waterbury, Proctor, and Troy/Jay. Based on operating experience at Hinesburg, and research on aerated lagoon facilities removing phosphorus in cold climates, the Department decided to direct the aerated lagoon facilities to an 'in-lagoon' removal process.

The second change applied an annual average load limit, calculated at an effluent phosphorus concentration of 0.6 mg/l at the currently permitted flow, to all facilities that are currently required to achieve a 0.8 mg/l limit. These are activated sludge facilities with a permitted discharge of 0.2 mgd or greater. This change requires capital improvements at ten municipal facilities: Barre City, Brandon, Burlington North and East plants, Essex Junction, Montpelier, Morrisville, Rutland City, South Burlington - Airport Parkway, and Winooski. For these facilities, it has been assumed that implementation would consist of the construction and operation of optional selector zones where they would be appropriate additions to the existing facility.

Phosphorus Reduction

The phosphorus discharge reductions required of the 60 currently permitted facilities in the Vermont portion of the Lake Champlain Basin--some of which are not municipally-owned, and some of which will be able to meet the reduced discharge limits without a capital improvement project--total 22.3 mt/y (metric tons per year). The reduction from the five aerated lagoon and ten activated sludge plants noted above total 16.2 mt/y.

The Department developed a schedule to spread costs over state fiscal years 2005 - 2010. The aerated lagoon facilities were scheduled first, for consideration of both their permit renewal dates and a much larger relative benefit. This is the reduction of discharges from the five aerated lagoon facilities from the default 5.0 mg/l level to just 0.8 mg/l. This translates to a reduction of 10.4 mt/y whereas reducing the ten activated sludge facilities discharges from 0.8 mg/l to 0.6 mg/l will save 5.8 mt/y (all calculations are based on the facilities' design average flows).

The Richford and Troy/Jay Facility Projects

The Richford and Troy/Jay projects were allocated funds ($1.0M total) for planning, design and construction in the SFY 2005 Capital Bill. The Richford project's Preliminary engineering has been completed and final design is at 25% point approximately. The project is anticipated to go to bid in the spring of 2005 and be completed this year. The Troy/Jay project is in the early preliminary

engineering phase, and although a schedule has not been developed, it is anticipated that this project will go to bid and be completed in 2006.

The Hardwick and Waterbury Projects

Phosphorus treatment upgrades at the lagoon-type wastewater treatment plants in Hardwick ($500,000) and Waterbury ($500,000) are recommended for funding in the Governor's FY06 capital budget.

Wastewater Treatment Performance Indicators

Attached is a schedule that shows the wastewater treatment plant projects from the Lake Champlain Phosphorus TMDL that the Agency proposes to fund on the accelerated schedule outlined in the Clean and Clear Action Plan. We will track the phosphorus reductions funded at these facilities.

Lake Champlain Phosphorus TMDL – Proposed Schedule

Point Source Phosphorus Reduction Projects
Lake Champlain Phosphorus TMDL Wastewater Treatment Facility Upgrades
Tracking of Phosphorus Removal Project Implementation
January 27, 2005

Facility Name	**Permitted Capacity mgd**	**Permit Expiration Date[1]**	**Facility Type**	**Estimated Capital Cost**	**Suggested Fiscal Year for Funding**	**Previously Permitted Load mt/y**	**TMDL Wasteload Allocation mt/y**	**Reduction in Permitted Load my/y**	**Reduction Funded mt/y**
Richford[2]	0.38	6/30/2004	Large Lagoon	$690,000	2005	2.624	0.420	2.204	**2.204**
Troy/Jay[2]	0.2	9/30/2004	Large Lagoon	$500,000	2005	1.381	0.221	1.160	**1.16**
				$1,000,000					
Hardwick[2]	0.371	12/31/2004	Large Lagoon	$500,000	2006	2.562	0.410	2.152	
Waterbury[2]	0.51	12/31/2004	Large Lagoon	$500,000	2006	3.522	0.563	2.958	
				$1,000,000					
Proctor[2]	0.325	12/31/2006	Large Lagoon	$500,000	2007	2.244	0.359	1.885	
Essex Junction	3.1	6/30/2004	Activated Sludge	$650,000	2007	3.047	2.569	0.478	
				$1,100,000					
Burlington East	1.2	9/30/2004	Activated Sludge	$400,000	2008	1.325	0.994	0.330	
Winooski	1.4	12/31/2004	Activated Sludge	$425,000	2008	1.325	1.160	0.165	
Barre	4	9/30/2006	Activated Sludge	$650,000	2008	3.759	3.314	0.445	
				$1,475,000					
Airport Pkwy (So. Burl)	2.3	3/31/2008	Activated Sludge	$525,000	2009	2.534	1.906	0.628	
Rutland	6.8	6/30/2008	Activated Sludge	$800,000	2009	7.518	5.634	1.884	
Morrisville	0.425	9/30/2008	Activated Sludge	$250,000	2009	0.464	0.352	0.112	
				$1,575,000					
Brandon[3]	0.7	12/31/2006	Activated Sludge	$300,000	2010	0.778	0.580	0.198	
Montpelier[3]	3.97	12/31/2007	Activated Sludge	$650,000	2010	4.388	3.290	1.099	
Burlington North[3]	2	9/30/2004	Activated Sludge	$500,000	2010	2.202	1.657	0.545	
				$1,450,000					
				$7,600,000		39.673	23.429	16.243	**3.364**

[1] Renewed permits will contain a schedule for the implementation of the phosphorus removal project.
[2] Lagoon projects are prioritized primarily due to the relatively high water quality benefit.
[3] Annual Phosphorus discharges from these plants are currently below levels established in the TMDL, because flows are below design capacity. This schedule can be changed if increased flows indicate that additional treatment is needed sooner.